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Ontario Egg Layer Industry Research and Services Committee

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EXECUTIVE SUMMARY

The demand for eggs is relatively stable. Sales in the shell (table eggs) have increased slightly in the past year. Sales to further processing, having increased dramatically for the past decade, have also stabilized, although this market is changing as processors seek out new products and customers. This has important implications in egg pricing because the farm gate price includes a significant element of levies, used to reduce the cost of eggs to further processors.

The number of egg producers continues its decline, with associated increases in average flock size. The emergence of a few large producers with flocks of 60,000 to 100,000 creates a challenge in manure utilization, since some of the large producers operate without a large land base.

The farm gate price for eggs in 1997 was significantly below that for 1996, due to falling feed prices.

While there have been no reported cases of human Salmonella

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food poisoning in the past year, attributed to eggs, Salmonella enteritidis continues to preoccupy the egg industry as a potential problem.

Calcium metabolism may become a limiting factor for today's highly efficient layer, and research is needed to elucidate some of these mechanisms.

The tendency for consumption of eggs in the shell to remain at traditional levels results in the need to intensify research into new uses and technologies for eggs, in both food and non-food applications.

Maintaining laboratory services is an important requirement of the layer industry. Flock health is at an all time high, but only with the continued existence of supporting laboratory and research facilities can industry expect this to continue.

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INTRODUCTION

The egg industry is characterized by gradual reduction in the number of producers, and associated increase in flock size (see State of the Industry) and in general, very high levels of productivity and efficiency. The development by breeders of highly efficient stocks and the specification of nutrient requirements resulting from previous research has made this possible.

While productivity and efficiency are high, and profitability satisfactory, the need for continued research still exists. However, the priorities are changing, largely in response to public pressures in such areas as food safety and resource utilization. In addition, these highly efficient flocks tend to respond more acutely than before to relatively minor shifts in nutrition or environment.

While research resources have now stabilized following the closure of Agriculture and AgriFood Canada's Ottawa facility, and the reorganization of the OMAFRA - University of Guelph partnership, the Egg Industry is still concerned that a "critical mass" of Poultry Science expertise is not available. It is particularly concerned that the role of researchers in extension has been essentially curtailed, with staff claiming "no extension budget" when requests are made.

The Poultry Industry Council (formed by the merger in 1997 of the Poultry Industry Centre and the Ontario Poultry Council) is investigating the future potential for expanding the resources available for Poultry Research and Technology Transfer. Results of this study, and a business plan for future development, should be available in late 1998.

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COMMITTEE ACTIVITY

The Egg Layer Committee met on July 22, 1998 at the Poultry

Industry Centre. Four of the members attended in person and two submitted material by fax. Input was also received from the Egg Producers' Research Committee, which discussed research priorities at its May 1998 meeting.

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STATE OF THE INDUSTRY

At the end of 1997, there were 466 registered Egg Producers in Ontario. This compares with 499 at the end of 1996, and 789 at the end of 1986. The total quota allocated to Ontario in 1997 was 6,932,857 hens, and the average size of a laying flock was 14,877 hens. Ontario now has only 183 registered pullet growers, with allocated quota of 8,268,275. This compares with 289 quota holders and 11,460,811 pullet quota in 1987. The trend towards layer producers growing their own pullets continues.

There are now only five hatcheries supplying significant numbers of chicks to the egg industry, and one of these operates only seasonally.

Producer prices were lower in 1997 than the previous year, as a result of reduced feed prices, and this trend has continued in 1998. Egg prices for Ontario, set on June 18,1998 were:

Grade A Extra Large	$1.26/doz
Grade A Large	$1.26/doz
Grade A Medium	$1.19/doz
Grade A Small	$0.75/doz

These prices are approximately 6 cents/dozen below the average for 1997, again resulting from falling feed prices throughout 1997 and early 1998. The levy on these egg prices necessary to finance the Industrial Product program (eggs diverted from the shell market for breaking and further processing) has averaged approximately 15 cents/dozen for 1997-98.

10.4 million boxes (of 15 dozen each) of Ontario eggs were graded in 1997, essentially the same as in 1996. Of these, 18.3% were used as Industrial Product, up from 17.3% in 1996. The proportion of eggs going for further processing is expected to increase in the future. There are six Egg Further Processing plants active in Ontario as of July, 1998.
In the US, the proportion of eggs further processed is approaching 30% and rising consistently from year to year. This is the result of the development of new products and new ways to use liquid, frozen and dried egg in food production. It also results from some users moving away from shell eggs because of fears of Salmonella contamination.

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EMERGING ISSUES

As the number of quota holders declines, flock size increases. Economies of size in a free market dictate that in the future, houses holding 60,000 to 100,000 hens will become commonplace. The compatibility of these operations with rural populations will increasingly be questioned. Already, in some townships in Ontario, by-laws exist which would preclude such operations. Responsible producers should be able to create these highly efficient units and operate them to provide suitable environmental stewardship. Competitiveness within NAFTA and the world market in general will require producers to build these large poultry farms.

Development of resource utilization plans using existing and new technology will be an essential part of the planning process. Producers must be assured that they will be able to proceed provided they are able to meet agreed standards and comply with reasonable regulations.

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ACTION TAKEN ON 1997 RECOMMENDATIONS

Recommendation 1 Quality And Composition Of Eggs	Some work by Dr. Gibbins is in progress at the Univ. of Guelph and a considerable volume of research (not listed in the OMAFRA database) is being undertaken by the Egg Materials Research Chair in the Department of Food Science. This Chair is funded by the Ontario Egg Board and NSERC.
Recommendation 2 Health of layers; Marek's disease, Cage layer Fatigue, Hepatitis	Some work on fatty Liver Hemorrhagic syndrome is in progress.
Recommendation 3 Environmental issues; manure processing and utilization, nutrient management, etc..	Nothing specific to egg layers.
Recommendation 4 Nutrition; use of by-products, new corn varieties, enzymes	None
Recommendation 5 Animal welfare	Some work on behaviour x husbandry

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SUMMARY AND DISTRIBUTION OF RECOMMENDATIONS

RECOMMENDATION	AAFC	ARIO	CC	CARC	OMAFRA	OTHER
Food Safety	X	X			X	
Calcium Metabolism		X				
Egg Quality & Composition		X				
Poultry Health	X	X			X	
Animal Welfare	X	X				

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1998 RECOMMENDATIONS

1: FOOD SAFETY **PRIORITY 1-B**

TO: AAFC (CFIA), ARIO, OMAFRA

Develop improved methods for the detection and control of the important Salmonella serotypes which affect the egg industry.

DETAIL:

The efficacy of vaccines, probiotics and competitive exclusion products in reducing or eliminating Salmonella from growing birds is not well established, and requires further research. Sampling and analytical methods also require improvement.

While S.enteritidis remains the serotype of greatest concern to the egg and food industry, S.typhimurium DT104 is also of concern because of its ubiquitous nature and apparent resistance to many antibiotics. Research on detection and control of this serotype on poultry farms may become a priority.

Because rodents, especially mice, have been identified as important carriers of Salmonella in layer facilities, it is felt that research should be initiated to develop new and improved methods for eliminating them from production sites.

BACKGROUND:

While Ontario has a good record in acting to reduce the already low level of Salmonella among its laying flock, there is a need for research to assist in maintaining this momentum. Currently, the environments of laying houses and pullet houses are checked for Salmonella once during the life of each flock. Eggs from laying houses found positive for S.enteritidis are diverted for further processing which includes pasteurization. Pullets on S.enteritidis positive premises are slaughtered and growers compensated from a special producer-financed fund established for this purpose.

The CEMA has introduced a HACCP based program for egg producers which provides guidelines for improved food safety. Ontario Egg Producers have a Pilot HACCP Project intended to lead to a certifiable HACCP program for Egg Producers. Improved treatments and testing procedures would fit naturally into these programs.

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2. CALCIUM METABOLISM **PRIORITY 1-A**

TO: ARIO

Develop an improved knowledge of the metabolism of calcium and related nutrients as this affects egg shell structure and formation, bone integrity and the incidence of cage layer fatigue.

DETAIL:

To prepare for the time when laying hens consume even less feed than today, and are therefore even more efficient, research into the pathways of calcium metabolism is required. This should embrace all other known nutrients which interact in the metabolism of calcium and which contribute to egg shell formation and the maintenance of bone integrity.

Cage layer fatigue is one manifestation of impaired bone integrity; another is the brittle bone condition found among spent fowl, which may result in bones being broken when the hens are being caught and loaded prior to slaughter. This is a potential welfare problem.

BACKGROUND:

Contemporary layers consume 10 - 15 g less feed per day than those of even ten years ago. This creates difficulties in feed formulation, since the nutrients necessary for the daily production of a complete egg must still be packaged within ever decreasing quantities of feed. A critical nutrient is calcium, because it is involved in both egg shell formation and bone integrity. The egg shell contains about 2.0 g of calcium, which is derived partly from the diet, and partly from calcium reservoirs in the medullary bone, which must be restored prior to the formation of the following day's egg.

Calcium deficiency, resulting from low feed intake, inadequate or malabsorption of calcium in the feed, a combination of these, or the interaction of other nutrients such as Vitamin D or phosphorus, may result in a variety of outcomes. These include thin shelled eggs, osteoporosis, cage layer fatigue, and cessation of egg production.

Sometimes, hens will attempt to satisfy their calcium need by over-consuming feed, and this may result in excesses of other nutrients which must be dealt with, perhaps resulting in liver damage or Fatty Liver Hemorrhagic syndrome.

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3. EGG QUALITY AND COMPOSITION; NEW AND VALUE-ADDED PRODUCTS **PRIORITY 1-B**

TO: ARIO

Building on the success of T-3 enriched eggs, we must develop more added value eggs and egg products. While the food industry is the primary target, research should include other applications such as the biological and pharmaceutical areas.

DETAIL:

Some flocks producing T-3 enriched eggs have reduced or inconsistent feed intake when flax in incorporated in their feed, resulting in reduced egg production and/or egg size. Refinements of this technology are needed to reduce costs and make the system more acceptable to producers.

Research is required to determine what other nutrients of value to the human diet could be incorporated into eggs to create and satisfy other "niche" market demands.

In this same general area, it is felt that a study of consumer attitudes to eggs would be valuable in determining how consumers perceive eggs in relation to their diet and other lifestyle factors.

A whole new industry is developing to produce eggs containing specific antibodies for human and animal therapy and diagnostic work. Further research is required to develop and expand this market. Not only antibodies, but also biochemical compounds, should be included in this research.

BACKGROUND:

Eggs enriched with T-3 fatty acids now enjoy up to 5% of the shell egg market, following their introduction three years ago. As a greater variety of eggs and egg products are developed, more research is needed into the availability of nutrients from existing and novel feed ingredients. These parameters may change as new varieties of birds are introduced with different characteristics.

Building novel biochemical products and immunoglobulins into eggs for the pharmaceutical and biological industries is just beginning. Canada is a world leader in the extraction and marketing of lysozyme from eggs, but there is a wealth of other potential products which can be produced in a similar way.

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4. POULTRY HEALTH **PRIORITY 1-B**

TO: AAFC, ARIO, OMAFRA

Maintain and enhance the diagnostic and laboratory services available at the University of Guelph. Improve the capability in the area of virology specifically to determine the types of Infectious Bronchitis viruses in the Ontario layer industry.

DETAIL:

Infectious Bronchitis is a continuing threat to the layer industry,

and there is a need for research to identify which types of the virus are present in Ontario layer farms, and which of the available vaccines are most appropriate for their control.

BACKGROUND:

The continued availability of Laboratory Services is a major priority of the poultry industry. Strengthened primary diagnostic services involving Laboratory Services and private veterinary practitioners, as well as follow-up in specialized fields such as histology, serology and microbiology are essential to provide a sufficiently large database for informative disease surveillance.

Producers are concerned as to whether the Avian Leukosis J-Virus is likely to have an impact on the egg industry as it has in broiler breeders. Research is required in this area.

The general issue of disease surveillance is of increasing importance. Government is often forced to rely on informal "word of mouth" reports and with increasing international trade in the future, there is a need for greater emphasis on internal disease surveillance.

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5. ANIMAL WELFARE **PRIORITY 2-A**

TO: AAFC, ARIO

Conduct research on the technology, efficacy and consequences of early (0 - 10 d) beak trimming for laying pullets.

DETAIL:

Almost all Ontario flocks are beak trimmed, many between six and ten weeks of age, when it is acknowledged that a set-back of almost one week's growth is expected. Research on the efficacy and consequences of earlier beak trimming would be valuable. Development of new technology to carry out early beak trimming may also help, if it makes the job easier.

BACKGROUND:

Layer producers are urged to conform with the Recommended Codes of Practice for Poultry in all respects. One of the most visible aspects which consumers and welfare critics highlight is beak trimming. Long-term, it is possible that layer strains will become available which will thrive in high density housing without beak trimming, but they are not available currently.

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